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EXAMINER	
LEUNG, JENNIFER A	

ART UNIT	PAPER NUMBER
1764	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/683,658	D'EVELYN ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *104-146* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *104-146* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on July 18, 2005 has been received and carefully considered. The changes made to the specification are acceptable. Claims 1-103 have been cancelled. Claims 104-146 are newly added and are under examination.

Claim Objections

2. Claims 112 and 146 are objected to because in claim 112, "the restrain portion" (line 4) should be changed to --the restraint portion--, and in claim 146, "an amount of a ammonia" (line 3) should be changed to --an amount of ammonia--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 130, 131 and 139-146 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 130 and 131, it is unclear as to the structural limitation applicant is attempting to recite by, "the restraint is operable to transmit pressure to the capsule such that the transmitted pressure to the capsule is measurable as a pressure response of less than about 0.2 [or 0.05]". Section [0032] of the specification defines the "pressure response" as the "percent increase in cell pressure divided by the percent increase in press force that produces the increased cell pressure, relative to a reference operation condition." The pressure response is hence a process limitation.

Regarding claim 139, it is unclear as to the structural limitation applicant is attempting to recite by, "the press is operable to apply only a pre-load pressure to the pressure transmission medium prior to the operation of the energy source," in lines 4-5, because it is unclear as to what is meant by a "pre-load pressure". In the case that applicant is attempting to claim a sequence of operating the press prior to operating the energy source, please note that the sequence of operating the separate elements of the apparatus is considered a process limitation or intended use that provides no further weight to apparatus claims.

Regarding claims 141-145, it is unclear as to the structural limitations applicant is attempting to further recite, because the particular material and the particular fluid received in the capsule is not considered an element of the apparatus.

Regarding claim 146, it is unclear as to the structural limitation applicant is attempting to recite by, "the restraint is operable to provide no active pressure load to the capsule, or a pre-load pressure only to the capsule," in lines 10-11, because it is unclear as to what is meant by a "no active pressure load" or a "pre-load pressure only". In the case that applicant is attempting to claim a sequence of operating the restraint prior to operating the energy source, please note that the sequence of operating the separate elements of the apparatus is considered a process limitation or intended use that provides no further weight to apparatus claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 104, 105, 112-114, 120-125, 127-133 and 139-146 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilson et al. (US 3,473,935).

Regarding claim 104, Wilson et al. (FIG. 1, 2) discloses an apparatus comprising:

a capsule having an interior surface defining a volume (i.e., closed and sealed capsule **31**, defining a chamber; column 2, line 61 to column 3, line 7), wherein the capsule is configured to receive a material and a fluid in the capsule volume (i.e., a material **29** to be crystallized, and water in an amount not exceeding about 6.5 wt percent of the material; column 4, lines 2-20);

a restraint having an interior surface defining a chamber for receiving the capsule **31** (i.e., press pistons **23**, **24** with end elements **26**, **27** defining surfaces biased toward one another by a hydraulic press, not shown, in cooperation with core **16** to define a chamber containing the capsule **31**); and

an energy source operable to supply thermal energy to the capsule **31** (i.e., a heating element comprising a carbon cylinder **33** proximate to said capsule **31**, and a wattage control system comprising conductors **39** and **40** electrically coupled to said heating element **33**; column 3, lines 45-54).

Because the apparatus is configured to exert pressures of up to 60,000 atmospheres (column 3, lines 43-44) and temperatures of up to about 2000 °C (see Examples I-VI) in the capsule, the fluid (i.e., water) added to the capsule **31** is inherently operable to become supercritical at a predetermined temperature and a predetermined pressure.

Regarding claim 105, the restraint **23**,**24**,**26**,**27** is operable to counterbalance the pressure in the capsule **31** (i.e., since the restraint is configured to exert pressures of up to 60,000

atmospheres on the capsule; column 3, lines 43-44), and the restraint **23,24,26,27** is immobile relative to the capsule **31** while counterbalancing the capsule **31** pressure (i.e., since the restraint is maintained in a fixed position by cooperation with core **16**).

Regarding claims 112-114, Wilson et al. (column 3, lines 23-44) discloses a clamp (i.e., core **16**) in contact with the restraint **23,24,26,27**, and a gasket (i.e., electrically insulating pyrophyllite members **43**, **44**) disposed between clamp **16** and a portion of the restraint (i.e., end element portions **26**, **27**). Pyrophyllite is an aluminum silicate mineral, $Al_2Si_4O_{10}(OH)_2$.

Regarding claim 120, Wilson et al. (FIG. 2; column 3, lines 32-40) discloses a seal (i.e., electrically conducting end caps **37**, **38**; column 3, lines 33-40) for sealing the capsule **31**.

Regarding claim 121, as can be seen in FIG. 2, the seal **37**, **38** comprises a deformable ring (i.e., the upper and lower portions of pyrophyllite cylinder **36**) operable to form a seal between the restraint **23,24,26,27** and a clamp (i.e., die **16**) supporting the restraint.

Regarding claim 122 and 125, Wilson et al. discloses a pressure transmission medium (i.e., pyrophyllite plugs **34**, **35**, **36**; talc cylinder **32**; column 3, lines 23-45) disposed within the restraint chamber and surrounding said capsule **31**.

Regarding claims 123 and 124, pyrophyllite plug **34**, **35**, **36** and talc cylinder **32** (column 3, lines 23-44) are inherently thermally stable up to about 1000 °C with an internal friction of less than about 0.2, and inherently a solid up to about 1300 °C (i.e., pyrophyllite and talc are defined by Applicant in section [0020] to exhibit such properties).

Regarding claims 127 and 128, Wilson et al. (column 3, lines 7-22) discloses the restraint comprises a die (i.e., core **16**), a punch (i.e., end elements **26**, **27**), and a press (i.e., press pistons **23**, **24** with a hydraulic press, not shown), wherein the die **16** is formed of tungsten carbide and

comprises a straight-walled die (see FIG. 1).

Regarding claim 129, the restraint comprises a compression ring (i.e., concentric binding rings **11-15**; column 3, lines 7-22) and the die **16** is receivable within the compression ring.

Regarding claims 130 and 131, as defined in section [0032] of the specification, the "pressure response" is the "percent increase in cell pressure divided by the percent increase in press force that produces the increased cell pressure, relative to a reference operation condition." Such are variables of an intended process. The apparatus of Wilson et al. structurally meets the claims because the "pressure response" is not considered an element of the apparatus.

Regarding claim 132, Wilson et al. discloses a restraint comprising a multi-anvil press (i.e., multiple press pistons **23** and **24** with end elements **26** and **27**, respectively; FIG. 1).

Regarding claim 133, the restraint comprises a plurality of support plates (i.e., end caps **37**, **38**) disposed between a respective anvil (i.e., end elements **26** and **27**) and a pressure transmission medium (i.e., plugs **34**, **35**, **36**; cylinder **32**; column 3, lines 23-45) surrounding at least a portion of the capsule **31**.

Regarding claims 139 and 140, Wilson et al. discloses a press (i.e., press pistons **23**, **24** with a hydraulic press, not shown) in pressure communication with a pressure transmission medium (i.e., pyrophyllite plugs **34**, **35**, **36**; talc cylinder **32**; column 3, lines 23-45), the pressure transmission medium being in pressure communication with the capsule **31**. The press is operable apply a pressure to the pressure transmission medium **32, 34, 35, 36** (i.e., up to 60,000 atmospheres; column 3, lines 43-44) and operable to remain immobile in response to pressure exerted by the capsule **31** to the pressure transmission medium **32, 34, 35, 36** (i.e., the press is maintained in a fixed position by cooperation with core **16**). The sequence of actuating the press

with respect to the energy source (i.e., applying a pre-load pressure... prior to the operation of the energy source) is considered a process limitation that provides no further structure to the claim. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In any event, "[t]he process is carried out in the apparatus by first adjusting the pressure to the proper value. The temperature is then raised until the powder melt by passing an electric current though carbon cylinder **33**." (column 3, lines 45-49).

Regarding claims 141-145, although the particular metal selected for material **29** is not considered an element of the apparatus, Wilson et al. further discloses a suitable material **29** comprising beryl metals, which may include aluminum metal (see column 1, line 67 to column 2, line 8). In addition, although Wilson et al. does not disclose the particular fluid added to capsule **31** comprising the instantly recited fluids, such as ammonia, the apparatus structurally meets the claim because the particular fluid to be processed within the capsule **31** is not considered an element of the apparatus but a matter of intended use. As recited in claim 1, the capsule is "configured to receive a material and a fluid in the capsule volume." The capsule **31** need only be capable of performing the intended use of receiving ammonia. Because the capsule **31** is capable of receiving fluids (i.e., a fluorine gas or water; column 4, lines 2-30), the capsule **31** is capable of receiving a nitrogen-containing compound such as ammonia. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Regarding claim 146, Wilson et al. (FIG. 1, 2) discloses an apparatus comprising:

a capsule having an interior surface defining a volume (i.e., closed and sealed capsule **31**, defining a chamber; column 2, line 61 to column 3, line 7), wherein the capsule is configured to receive a metal material and a fluid in the capsule volume (i.e., a material **29** to be crystallized, such as beryl and members of the beryl family, and a fluid such as water in an amount not exceeding about 6.5 wt percent of the material, or a flux such as fluorine; column 1, line 67 to column 2, line 9; column 4, lines 2-30);

a restraint having an interior surface defining a chamber for receiving the capsule **31** (i.e., press pistons **23**, **24** with end elements **26**, **27** defining surfaces biased toward one another by a hydraulic press, not shown, in cooperation with core **16** to define a chamber containing the capsule **31**); and

an energy source operable to supply thermal energy to the capsule **31** (i.e., a heating element comprising a carbon cylinder **33** proximate to said capsule **31**, and a wattage control system comprising conductors **39** and **40** electrically coupled to said heating element **33**; column 3, lines 45-54).

Although Wilson et al. does not disclose a fluid comprising ammonia, the apparatus structurally meets the claim because the particular fluid to be processed is not considered an element of the apparatus but a matter of intended use. As recited in the claim, the capsule is "configured to receive a metal material and an amount of a ammonia in the capsule volume." The capsule **31** need only be capable of performing the intended use of receiving an amount of ammonia. Because the capsule **31** is capable of receiving fluids including gases and liquids (i.e., a fluorine gas or water), the capsule **31** is inherently capable of receiving ammonia. A recitation of the

intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In addition, because the apparatus is configured to exert pressures of up to 60,000 atmospheres (column 3, lines 43-44) and temperatures of up to about 2000 °C (see Examples I-VI) in the capsule, the fluid added to the capsule **31** is inherently operable to become supercritical at a predetermined temperature and a predetermined pressure. As best understood, the restraint is further operable to apply a pre-load pressure, since "The process is carried out in the apparatus by first adjusting the pressure to the proper value. The temperature is then raised until the powder melt by passing an electric current though carbon cylinder **33**." (column 3, lines 45-49).

Instant claims 104, 105, 112-114, 120-125, 127-133 and 139-146 structurally read on the apparatus of Wilson et al.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 106-108, 111, 118 and 119 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (US 3,473,935) in view of Hall et al. (US 2,947,610).

Regarding claims 106-108, Wilson et al. discloses a heating system that includes at least one heating element (i.e., carbon cylinder or tube **33**) inserted in said pressure transmission medium **32**, **34**, **35**, **36** such that said heating element **33** is proximate to said capsule **31**, and an energy source comprising wattage control system electrically coupled to said heating element **33** to provide power to said heating element (i.e., conductors **39** and **40**, comprising means for

controlling the passage of an electric current to heating element **33** and then abruptly cutting off the electric current; column 3, lines 45-54). A control system is inherently in communication with the heating system, as evidenced by the disclosed abilities to raise the temperature of the heating system and to abruptly cut off the electric current to the heating system. Wilson et al., however, is silent as to the control system being operable to provide a closed loop temperature control of the heating system, in response to a signal generated by a temperature sensor disposed proximate to the capsule **31**. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a temperature sensor and to configure a closed loop temperature control scheme for the control system in the apparatus of Wilson et al., on the basis of suitability for the intended use, because it is well known in the art to connect a control system with a temperature sensor to enable precise, closed loop control of the reaction temperature, as evidenced by Hall et al., and the provision of automated means to replace manual activity was held to have been obvious. *In re Venner* 120 USPQ 192 (CCPA 1958); *In re Rundell* 9 USPQ 220 (CCPA 1931). In particular, Hall et al. (see column 7, lines 18-63) teaches an apparatus, similar to the apparatus of Wilson et al., wherein the temperature in a reaction vessel **32** is determined by fairly conventional means of placing a thermocouple in the reaction vessel and measuring the temperature in the usual manner. Electrical energy at a predetermined rate is then supplied to the apparatus, and the temperature produced by this power is measured by the thermocouple. The same procedure is repeated with different power inputs to produce a calibration curve of power input versus the temperature in the reaction vessel. The temperature within reaction vessel **32** is thus controlled in a "closed loop" fashion according to the power input to the apparatus in conjunction with the calibration curve.

Regarding claim 111, although Wilson et al. is silent as to heating a first portion of said capsule **31** to a first temperature and a second portion of said capsule **31** to a second temperature, it would have been obvious for one of ordinary skill in the art at the time the invention was made to vary the temperature across the different portions of the capsule in the apparatus of Wilson et al., on the basis of suitability for the intended use, because it is known to vary the range of temperature between spaced points within a reaction vessel, as evidenced by Hall et al. (see column 7, lines 64-69), and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233*.

Regarding claims 118 and 119, Wilson et al. discloses gaskets comprised of an electrically insulating material (i.e., pyrophyllite members **43**, **44**) but is silent as to the gaskets comprising an electrically conductive element at least partially disposed within the gasket. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was substitute a gasket of the instantly claimed materials for the gasket **43,44** in the apparatus of Wilson et al., on the basis of suitability for the intended use, because the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). Hall et al. teaches a known, functionally equivalent gasket assembly **37** comprising a gasket **38** made from an electrically insulating material such as pyrophyllite, as well as a second gasket **39** made of an electrically conductive material such as steel (column 5, lines 3-24). Steel is a generally hard, strong, durable, malleable alloy of iron and carbon, usually containing between 0.2 and 1.5 percent

carbon, often with other constituents such as manganese, chromium, nickel, molybdenum, copper, tungsten, cobalt, or silicon, depending on the desired alloy properties, and widely used as a structural material.

6. Claims 109 and 110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (US 3,473,935) in view of Hall et al. (US 2,947,610), as applied to claims 106-108 above, and further in view of Strong (US 3,088,170).

Wilson et al. is silent as to the heating element **33** comprising a different type of heating element, such as an element comprised of one or more of the instantly claimed materials. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select other suitable, electrically conductive materials for the heating element **33** in the apparatus of Wilson et al., because the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958), and the selection of the instantly claimed materials for constructing heating elements in high-pressure, high-temperature apparatus is well known in the art, as evidenced by Strong (e.g., platinum, nickel, tantalum, titanium, tungsten, hard steel; column 4, line 69 to column 5, line 68).

7. Claim 115 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (US 3,473,935) in view of Bundy (US 3,107,395).

Wilson is silent as to the gaskets **43,44** further comprising at least one of the instantly claimed materials. Bundy (column 5, lines 43-63) discloses a gasket **40** comprising a rubber or suitable plastic elastic or resilient member **48** (FIG. 9). It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a rubber or suitable plastic

elastic or resilient member to the gaskets **43,44** in the apparatus of Wilson et al., on the basis of suitability for the intended use, because the rubber or suitable plastic elastic or resilient member helps prevent crumbling of the extremity of the gasket, as taught by Bundy.

8. Claims 116, 117 and 126 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (US 3,473,935) in view of Strong (US 3,030,662).

Regarding claims 116 and 117, Wilson et al. discloses gaskets **43**, **44** being comprised of pyrophyllite, wherein "some or all of the pyrophyllite members may be replaced by another pressure transmitting material such a boron nitride." (column 3, lines 55-63). Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute one of the instantly claimed materials for the gasket in the apparatus of Wilson et al., on the basis of suitability for the intended use, because the use of such materials as pressure transmission media is well known in the art, as evidenced by Strong, and furthermore, the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). Strong teaches suitable pressure transmission materials including, for example, pyrophyllite, graphite, magnesium oxide, and talc (see Tables I-III; column 3, line 15 to column 4, line 48).

Regarding claim 126, Wilson et al. discloses the pressure transmission medium comprising talc and pyrophyllite (i.e., pyrophyllite plugs **34**, **35**, **36**; talc cylinder **32**; column 3, lines 23-45), which is substitutable with other pressure transmission mediums such as boron nitride (column 3, lines 55-65). Wilson et al., however, is silent as to the medium comprising at least one of the materials as instantly claimed. In any event, it would have been obvious for one

of ordinary skill in the art at the time the invention was made to select one of the instantly claimed materials for the pressure transmission medium in the apparatus of Wilson et al., on the basis of suitability for the intended use, because the use of such materials as pressure transmission media is well known in the art, as evidenced by Strong, and furthermore, the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). Strong teaches suitable pressure transmission materials including, for example, sodium chloride, sodium fluoride, pyrophyllite, graphite, magnesium oxide (see Tables I-III; column 3, line 43 to column 4, line 48).

9. Claims 134 and 135 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (US 3,473,935) in view of Bridgman et al. (US 2,544,414).

Wilson et al. (column 3, lines 7-22) discloses the restraint comprises a die (i.e., core **16**), a punch (i.e., end elements **26**, **27**), and a press (i.e., press pistons **23**, **24** with a hydraulic press, not shown), said die **16** inherently being disposed between the two faces of the hydraulic press. Wilson et al., however, is silent as to the instantly claimed restraint structure for the hydraulic press; namely, a first end flange and a second end flange spaced from the first end flange, and a fastener joining the first end flange to the second end flange, wherein each end flange comprises a structural support to reinforce the corresponding end flange. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select the claimed restraint structure for hydraulic press in the apparatus of Wilson et al., on the basis of suitability for the intended use, because such restraint structures are well known in the art, and the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout*

213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). Bridgeman et al. (FIG. 1; column 2, lines 30-48) teaches a conventionally known hydraulic press comprising at least two end flanges (i.e., projections **22**, **23**), a structural support in the form of an "I-beam" (i.e., base **20**; iron cap **24**) for reinforcing each of the flanges **22**, **23**, and at least one fastener comprising at least one of a bolt and a threaded rod (i.e., threaded vertical shafts **22**, mating with nuts **26**, **25**).

10. Claim 136-138 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (US 3,473,935).

Regarding claim 136, Wilson et al. discloses, "[c]apsules formed from platinum and tungsten are not as effective since the melting and solidification must be performed rapidly in order to prevent diffusion." (column 3, lines 2-5). Although the use of platinum is nonpreferred, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select platinum metal for the capsule **31** material in the apparatus of Wilson et al., on the basis of suitability for the intended use, because the use of platinum metal capsules in high-pressure and high-temperature apparatuses is conventionally known in the art, as evidenced by Wilson et al., and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). Also, substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Regarding claim 137, Wilson et al. discloses the use of a carbon liner (column 3, lines 2-5) in the capsule, but is silent as to the use of liner comprising at least one of the instantly

claimed materials. Wilson et al., however, discloses the prior art use of materials including platinum for forming parts of the capsule, though this material is nonpreferred for performing the synthesis of beryl crystals. (column 3, lines 2-5). It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a platinum liner for the capsule **31** in the apparatus of Wilson et al., on the basis of suitability for the intended use, because the use of platinum metal as capsule material in high-pressure and high-temperature apparatuses is conventionally known in the art, as evidenced by Wilson et al., and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). Furthermore, substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Regarding claim 138, although Wilson et al. is silent as to the recited thicknesses for the liner, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a suitable thickness for the liner in the apparatus of Wilson et al., on the basis of suitability for the intended use, because changes is thickness involves ordinary skill in the art, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233.*

Response to Arguments

11. Applicant's arguments with respect to claims 104-146 have been considered but are moot in view of the new ground(s) of rejection, as necessitated by amendment. However, in response to Applicant's argument (page 11, last paragraph) that,

> "Particularly, the presses in the cited references supply the pressure to the object being worked on, and it is not the object that creates the pressure,"

please note that the pressure as created by the object has not been considered as an element of the apparatus. As recited in claim 104, for example,

> "... the capsule is configured to receive a material and a fluid in the capsule volume...the fluid is responsive to the thermal energy... to increase the pressure in the volume to at least the predetermined pressure."

The pressure is created by the fluid received in the capsule, but the fluid is not an element of the apparatus. As recited in the claim, the capsule "is configured to receive" the fluid, and therefore the capsule need only to be capable of performing the intended use of receiving the claimed fluid. And as disclosed in column 4, lines 2-30, the capsule **31** of Wilson et al. is capable of receiving fluid (i.e., a fluorine gas or water; column 4, lines 2-30). Furthermore, the fluid is inherently capable of undergoing supercritical conditions within the capsule, given that the apparatus of Wilson is configured to exert pressures of up to 60,000 atmospheres (column 3, lines 43-44) and temperatures of up to about 2000 °C (see Examples I-VI) on the capsule. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963).

Applicants (page 12, first paragraph) further argue that,

> "... the restraint is substantially passive, and for the most part the pressure the restraint supplies is merely to resist the outward force generated by the heating of the sealed capsule... the presses in the cited art must be active through the entire process, whereas a passive restraint simply resists by virtue of its configuration and composition - no energy needs to be expended."

However, "[t]he process is carried out in the apparatus by *first* adjusting the pressure to the proper value. The temperature is *then* raised until the powder melts by passing an electric current though carbon cylinder **33**." (Wilson et al., column 3, lines 45-49). Thus, the restraint is inherently operable to be passive, or fixed, once the pressure has been adjusted to the proper value, and the outward force supplied by the fluid and material within the capsule **31** may be generated by the subsequent heating of the sealed capsule.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

As set forth in 37 CFR 1.136(a), a shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung
September 30, 2005 JAL

Hien Tran

HIEN TRAN
PRIMARY EXAMINER